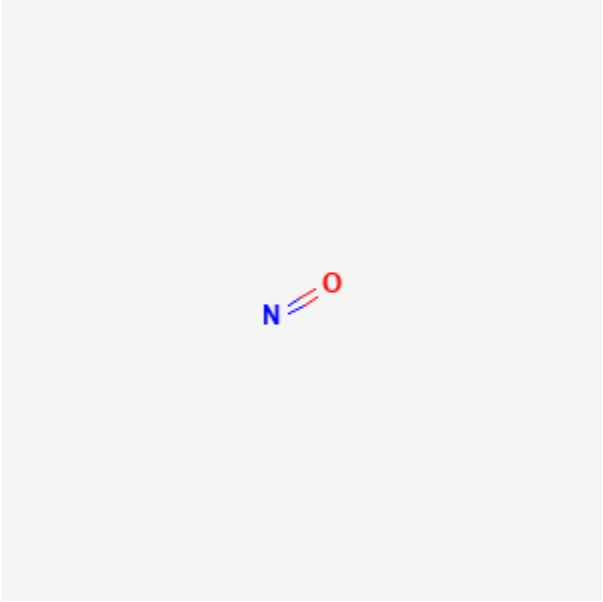
U.S. National Library of Medicine
National Center for Biotechnology Information

NLM Citation: Drugs and Lactation Database (LactMed®) [Internet]. Bethesda (MD): National Institute of Child Health and Human Development; 2006-. Nitric Oxide. [Updated 2024 May 15].
Bookshelf URL: https://www.ncbi.nlm.nih.gov/books/

Nitric Oxide

Revised: May 15, 2024.

CASRN: 10102-43-9



Drug Levels and Effects

Summary of Use during Lactation

No information is available on breastfeeding during the therapeutic use of nitric oxide by inhalation. Nitric oxide has a half-life of only a few seconds, so exogenously administered nitric oxide cannot reach the breastmilk. Nitric oxide is metabolized to methemoglobin and nitrate, which are present in the maternal systemic circulation. Although maternal nitrate serum levels may be elevated during nitric oxide administration,[1-3] this does not result in elevated breastmilk nitrate levels.[4,5] Both nitric oxide and nitrate are normal components of human milk,[6-8] and nitric oxide is administered directly to newborns by inhalation to treat respiratory failure. Given the above, it appears to be acceptable to breastfeed during maternal nitric oxide inhalation therapy.

Drug Levels

Maternal Levels. Relevant published information was not found as of the revision date.

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Relevant published information was not found as of the revision date.

Effects on Lactation and Breastmilk

Nitric oxide produced locally in the breast may have a role in the letdown reflex at the initiation of lactation. It results in high concentrations of nitrates and nitrites in breastmilk just prior to an increase in milk production.[9] Nitric oxide may also be involved with nipple erection.[10]

References

1. Valvini EM, Young JD. Serum nitrogen oxides during nitric oxide inhalation. Br J Anaesth 1995;74:338-9. PubMed PMID: 7718385.
2. Preiser JC, De Backer D, Debelle F, et al. The metabolic fate of long-term inhaled nitric oxide. J Crit Care 1998;13:97-103. PubMed PMID: 9758023.
3. Kostler WJ, Rabitsch W, Locker GJ, et al. Influence of inhaled nitric oxide on plasma nitrate concentrations in patients with adult respiratory distress syndrome and sepsis: Results of a pilot study. J Clin Anesth 2006;18:179-84. PubMed PMID: 16731319.
4. Green LC, Tannenbaum SR, Fox JG. Nitrate in human and canine milk. N Engl J Med 1982;306:1367. PubMed PMID: 7070470.
5. Greer FR, Shannon M, American Academy, of, Pediatrics, Committee, on, Nutrition, et al. Infant methemoglobinemia: The role of dietary nitrate in food and water. Pediatrics 2005;116:784-6. PubMed PMID: 16140723.
6. Berens P, Bryan NS. Nitrite and nitrate in human breast milk: Implications for development. In, Bryan NS, Loscalzo J, eds. Nitrite and nitrate in human health and disease. New York. Humana Press. 2017:139-53. Available at: https://link.springer.com/chapter/10.1007%2F978-3-319-46189-2_11.
7. Hord NG, Ghannam JS, Garg HK, et al. Nitrate and nitrite content of human, formula, bovine, and soy milks: Implications for dietary nitrite and nitrate recommendations. Breastfeed Med 2011;6:393-9. PubMed PMID: 20958096.
8. Akcay F, Aksoy H, Memisogullari R. Effect of breast-feeding on concentration of nitric oxide in breast milk. Ann Clin Biochem 2002;39:68-9. PubMed PMID: 11853194.
9. Iizuka T, Sasaki M, Oishi K, et al. Nitric oxide may trigger lactation in humans. J Pediatr 1998;131:839-43. PubMed PMID: 9427887.
10. Tezer M, Ozluk Y, Sanli O, et al. Nitric oxide may mediate nipple erection. J Androl 2012;33:805-10. PubMed PMID: 22207705.

Substance Identification

Substance Name

Nitric Oxide

CAS Registry Number

10102-43-9

Drug Class

Breast Feeding

Lactation

Milk, Human

Anti-Asthmatic Agents

Antioxidants

Autonomic Agents

Bronchodilator Agents

Cardiovascular Agents

Endothelium-Dependent Relaxing Factors

Free Radical Scavengers

Neurotransmitter Agents

Peripheral Nervous System Agents

Respiratory System Agents

Vasodilator Agents